National Energy Board

# Response to Recommendations in Transportation Safety Board Report No. P90H0606

## NEB Report R95-1

November 1995

102-05082/

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## Glossary and Abbreviations

| | |
|---|---|
| Crossing Regulations | *National Energy Board Pipeline Crossing Regulations* |
| CSA | Canadian Standards Assosciation |
| Z183 | CSA, CAN/CSA Z183-M90, Oil Pipeline Systems |
| Z184 | CSA, CAN/CSA Z184-M92, Gas Pipeline Systems |
| HVP | Hydrocarbons or hydrocarbon mixtures in the liquid or quasi-liquid state with a vapour pressure in excess of 340 kPa absolute at 38°C. The hydrocarbon products would include propane, butane, and derivative products such as ethylene and propylene. |
| HVP pipeline | A pipeline transporting HVP products. |
| Isolating Valve | A valve used for isolating laterals, stations, pressure relieving installations, and other facilities, from the main line. |
| Locations, Zone and Class | A geographic area, classified according to its approximate population density, that is to be considered when prescribing the design and methods of testing and operating pipelines to be located in the area. CSA Z183 defines these areas according to Zone 1 and 2 Locations and CSA Z184 defines these areas according to Class 1, 2, 3 and 4 Locations. |
| LVP | Hydrocarbons or hydrocarbon mixtures in the liquid or quasi-liquid state with a vapour pressure of 340 kPa absolute or less at 38°C. |
| LVP pipeline | A pipeline transporting LVP products. |
| NEB or Board | National Energy Board |
| Sectionalizing Valve | A valve for isolating a segment of a pipeline. |
| TCPL | TransCanada PipeLines Limited |
| TSB | Transportation Safety Board of Canada |

# Summary

On 15 March 1993 the Transportation Safety Board of Canada ("TSB") released a report on a pipeline incident which occurred on 6 June 1990 near Marionville, Ontario. While pre-ploughing a telephone cable trench with a bulldozer and an attached cable plough, a contractor punctured a pipeline that was owned and operated by TransCanada PipeLines Limited.

In section 4.2, Action Required, of its report the TSB recommended that:

> *"The National Energy Board evaluate the effectiveness of current practices among federally regulated pipeline companies for providing direction to contractors, and initiate improvements where required."* ***(P92-05)***
>
> *"The National Energy Board ensure that, in an emergency, sections of line beyond crossover points on federally regulated pipelines can be quickly and safely isolated."* ***(P92-06)***

In respect of the first recommendation, the Board considers that the current practices of federally-regulated pipeline companies are effective at providing direction to parties undertaking construction or excavation activities which may affect pipelines, and that improvements to those practices are implemented on an ongoing basis. Furthermore, the decline in the number of violations of the *National Energy Board Pipeline Crossing Regulations* reported to the Board since their promulgation in 1988 indicate a significant improvement in the current practices of federally-regulated pipeline companies.

In respect of the second recommendation, the Board felt that the scope of the recommendation was so specific that there would be very limited applicability to other pipeline systems under the Board's jurisdiction. Accordingly, in preparing a response to the recommendation, the Board decided to issue an information request to all pipeline companies under its jurisdiction which would address the following two factors that are pertinent to the issue of response time during emergencies:

a) the use of remotely operated valves for isolating critical sections of pipeline systems; and

b) company policies in respect of responding to reported leaks.

The Board considers that the requirements for valves in the Canadian Standards Association ("CSA") pipeline standards are acceptable minimum requirements. The responses to the information request indicate that most companies already meet or exceed the requirements in respect of the utilization of isolation and sectionalizing valves in the CSA standards, CAN/CSA Z183-M90, Oil Pipeline Systems and CAN/CSA Z184-M92, Gas Pipeline Systems, which allows them to quickly and safely isolate sections of their system during emergencies. In one case the Board determined that a pipeline company's facilities were not in compliance with the CSA requirements. Subsequently, corrective action was initiated.

## 1. Introduction

On 15 March 1993 the Transportation Safety Board of Canada ("TSB") released a report[1] on a pipeline incident which occurred on 6 June 1990 near Marionville, Ontario. While pre-ploughing a telephone cable trench with a bulldozer and an attached cable plough, a contractor punctured a pipeline that was owned and operated by TransCanada PipeLines Limited ("TCPL"). The contractor was working for Bell Canada, who had an inspector at the site. TCPL did not have a representative at the site to oversee the work because Bell Canada had not notified them of this activity near the pipeline right-of-way, as was required by paragraphs 4(f) and 6(f) of the *National Energy Board Pipeline Crossing Regulations, Part I* ("the Crossing Regulations, Part I"), and also by the crossing permit issued to Bell Canada by TCPL. The puncture caused an approximately 80 square centimetre hole in the pipeline and, according to the TSB Report, the release of 1,070,000 cubic metres of gas to the atmosphere. It took TCPL approximately 2 hours and 45 minutes after the occurrence to isolate the pipeline section with the reported leak.

As a result of its investigation, the TSB made two recommendations to the National Energy Board ("NEB" or "Board"). This report sets out the NEB's response to those recommendations.

## 2. Recommendation P92-05: Protective Measures for Excavation

> ***The National Energy Board evaluate the effectiveness of current practices among federally regulated pipeline companies for providing direction to contractors, and initiate improvements where required.***

The Board considers that it has in place the regulatory requirements, as well as the corresponding monitoring and enforcement practices, necessary to satisfy the recommendation.

### 2.1 Practices for Providing Direction to Contractors

Direction is provided to contractors and the general public through the ongoing public awareness programs established by pipeline companies pursuant to the *National Energy Board Pipeline Crossing Regulations Part II* ("the Crossing Regulations, Part II"). Subsection 4(1) of the Crossing Regulations, Part II requires that all federally-regulated pipeline companies establish ongoing public awareness programs to inform the public of the presence of pipelines and of the public's responsibilities regarding construction and excavation that might affect pipelines. Public awareness activities carried out by pipeline companies include:

a) meetings with contractors and contractor associations;

b) mailing and handing out notices and items bearing pipeline company logos and damage prevention messages to landowners, the general public and local businesses;

c) advertising by newspaper, radio and television;

d) participating in local utility operator committees and local one-call systems;

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[1] TSB Commodity Pipeline Occurrence Report P90H0606, dated 9 December 1992

e) exhibiting at trade shows and conferences;

f) meetings with municipal officials, and police and fire departments; and

g) meetings in the field with parties that are excavating or building in the proximity of pipeline rights-of-way.

In the process of granting permission for construction or excavation, site-specific direction is provided to contractors and parties wishing to construct facilities across or excavate near federally-regulated pipelines. The Crossing Regulations, Part I enable contractors and parties to obtain permission directly from pipeline companies for these activities. To minimize the possibility of damage to pipelines, the Crossing Regulations, Part I also establishes a communication process between parties seeking permission and pipeline companies. The principal requirements are as follows:

a) obtain written permission from the pipeline company prior to constructing or excavating;

b) provide three working days' notice to the pipeline company prior to commencing construction or excavation;

c) confirm with the pipeline company, prior to constructing or excavating, that all pipelines have been marked and that the significance of the pipeline markers has been explained to the satisfaction of the excavator;

d) comply with the instructions of the authorized pipeline company representative; and

e) restrict excavation within three metres of the pipeline unless the pipeline has been hand-exposed at the point of crossing or the pipeline company has agreed that mechanical excavation to within one metre of the pipeline may be performed safely and an authorized pipeline company representative supervises the excavation.

## 2.2 Evaluation of Practices

The Board evaluates pipeline company practices by monitoring compliance with the requirements of the Crossing Regulations through regular audits of pipeline companies and field inspections of sites where construction or excavation affects pipelines. Audits consist of reviewing records of crossing permissions granted and field inspections made by a pipeline company to ensure that the requirements of the Crossing Regulations are fulfilled. A pipeline company's public awareness programs and its assessment of the effectiveness of the program are reviewed to ensure that the pipeline company adequately discharges its public awareness responsibilities. Where necessary, Board staff provides suggestions to improve public awareness programs.

The Board conducts field inspections to verify that excavators and contractors are fulfilling their responsibilities pursuant to the Crossing Regulations and that pipeline companies are carrying out their responsibilities for the supervision of activities affecting pipelines and the inspection of facilities crossing pipelines.

The Board also evaluates the practices of pipeline companies through the analysis of crossing violation information. A violation is any contravention of the Crossing Regulations. Pursuant to section 13 of the Crossing Regulations, Part II, pipeline companies are required to report all violations to the Board.

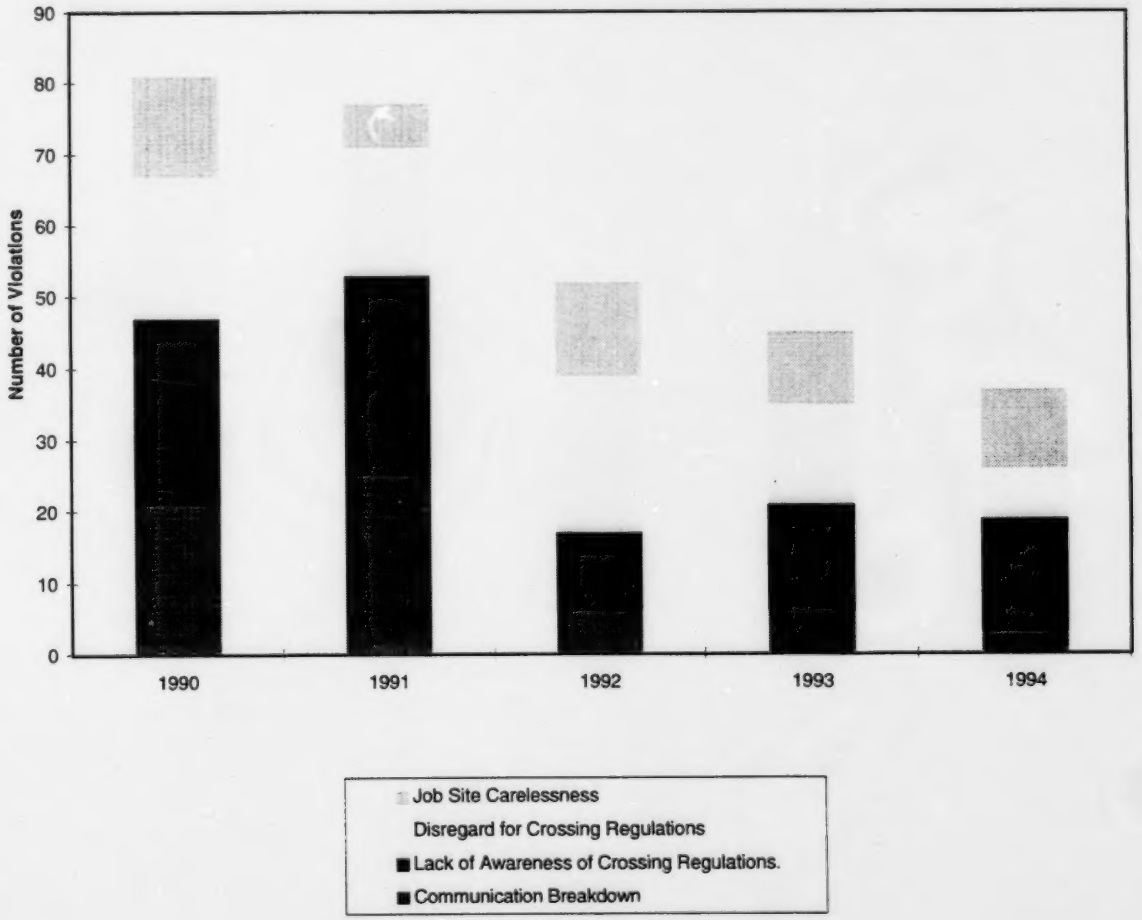
The Board conducts investigations of each violation to determine the cause and the actions necessary to prevent a recurrence. In the course of an investigation, all parties involved in a violation are interviewed (e.g., equipment operators, contractors, facility owners, and pipeline company personnel). Investigations are closed out only after staff is satisfied that all parties involved in the violation are aware of their respective responsibilities under the Crossing Regulations and that a recurrence of a similar violation will not likely occur.

The conclusions drawn from the investigations and trends identified from a review of violations assist the Board in determining areas for improvement for pipeline companies in their practices of granting permission for construction and excavation activities, and in their public awareness programs.

## 2.3 Effectiveness of Practices

An indication of the effectiveness of company practices is the decline in the number of third party violations of the Crossing Regulations for every year, since 1990, from 81 in 1990 to 37 in 1994. Figure 1 shows the number of third party violations from 1990 through 1994.

**Figure 1: Violations of the Crossing Regulations**



As shown in Figure 1, the types of violations have been categorized by cause as follows:

a) communication breakdown in the process of obtaining permission from the company;

b) lack of awareness of the Crossing Regulations;

c) disregard for the Crossing Regulations; and

d) job site carelessness.

The significant reduction in number of violations between 1990 and 1994 in the first two categories, communication breakdown and lack of awareness, is evidence of the effectiveness of the current practices of pipeline companies in providing direction to contractors. The reduction in violations due to communication breakdown is a result of improvements in communication between contractors and the pipeline companies, which in turn is a result of the efforts of pipeline companies and the Board in ensuring that the requirements of the Crossing Regulations are fulfilled. The reduction in number of violations due to a lack of awareness of the Crossing Regulations is a result of the public awareness programs established by pipeline companies.

### 2.4 Conclusion

The Board considers clear and effective communication between parties as the most effective means of preventing damage to pipelines. While the Board continually looks for ways to improve the Crossing Regulations, it is of the view that the current practices of federally-regulated pipeline companies are effective in providing direction to parties undertaking construction and excavation affecting their pipelines.

## 3. Recommendation P92-06: Response Time

***The National Energy Board ensure that, in an emergency, sections of the line beyond crossover points on federally regulated pipelines can be quickly and safely isolated.***

The Board was of the view that the scope of the recommendation was so specific (i.e.,"sections of line beyond crossover points") that there would be very limited applicability to other pipeline systems under the Board's jurisdiction. Accordingly, in preparing a response to the recommendation, the Board decided to investigate company practices in respect of the two factors that were discussed in *Section 4.2.2, Response Time*, of the TSB Report:

a) the use of remotely operated valves for isolating critical sections of pipeline systems; and

b) initial response of companies to reported leaks.

The Board issued an information request (see Appendix I) dated 14 May 1993 to the fifty-three pipeline companies under the Board's jurisdiction at that time to address these two factors.

## 3.1 Criteria for Emergency Response Capabilities

### 3.1.1 Use of Remotely Operated Valves

The criteria used to evaluate the acceptability of company practices pertaining to remotely operated isolation and sectionalizing valves were the requirements of the Canadian Standards Association ("CSA") standards *CAN/CSA Z183-M90, Oil Pipeline Systems* ("Z183") and *CAN/CSA Z184-M92, Gas Pipeline Systems* ("Z184")[2]. These standards identify the requirements for location and spacing of isolating and sectionalizing valves and the need for these valves to be equipped for remote operation. The applicable clauses are provided in Appendix II and summarized below.

The requirements of Z183 apply to pipelines that transport hydrocarbons for both low vapour pressure ("LVP") and high vapour pressure ("HVP") service. In summary, Z183 specifies that, with the exception of multiphase and oilfield water lines, pipelines shall have isolating valves installed on all laterals connected to mainlines. Sectionalizing valves shall be installed on both sides of major water crossings and "other locations appropriate for the terrain." This standard also requires HVP pipelines to have sectionalizing valves outside populated areas at the transition from Zone 1 to Zone 2 locations. The maximum spacing of these valves must not exceed 15 km. Also, sectionalizing valves must be equipped for remote operation where a pipeline failure would constitute an extraordinary hazard. The maximum spacing for sectionalizing valves to be equipped for remote operation in this circumstance is 15 km. The standard provides examples of the type of areas when evaluating the requirement for remotely operated valves to lessen the risk of an extraordinary hazard (i.e., "major industrial complexes, commercial navigable waters, and densely populated urban areas").

Z184, which applies to natural gas pipelines, specifies the minimum spacing requirements for sectionalizing valves in each of the various Class Locations but does not specify any requirements for valves to be equipped for remote operation. The standard also includes guidelines to be considered when deciding on the type and location of sectionalizing valves for transmission pipelines. These include guidelines for the use of automatic closing devices on block valves for sour service transmission pipelines.

### 3.1.2 Initial Response to Reported Leaks

Both CSA standards require companies to establish emergency procedures that include procedures for the safe control and shutdown of pipelines in the event of an emergency. However, neither standard sets out specific requirements for initial response to reported leaks; e.g., immediate shutdown, direct verification of leak, or analysis of telemetry data. In evaluating the response from the companies, the Board took into account the type of product transported, proximity to population and environmentally sensitive areas, diameter and operating pressure of the pipeline, and the risks associated with unnecessarily shutting down a pipeline.

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[2] Z183 and Z184 were the standards in force when the NEB issued the information request on 14 May 1993.

### 3.2 Evaluation of Emergency Response Capabilities

The Board received responses from all fifty-three companies to whom the information request was sent. The pipeline systems ranged from pipelines transporting production fluids from wellheads to national transmission pipeline systems. The types of hydrocarbons transported in these pipelines include natural gas, crude oil, and refined products. In order to facilitate the analysis of the responses, the companies were grouped according to pipeline service and system size into the following categories (see Appendix III):

a) category 1 oil companies, for major transmission pipeline systems which transport crude oil and refined products;

b) category 2 oil companies, for regional crude oil transmission pipeline systems;

c) products companies, for refined product pipeline systems;

d) category 1 gas companies, for major natural gas transmission pipeline systems;

e) category 2 gas companies, for regional and local natural gas pipeline systems which were further subdivided into:

   i) connection line companies, for pipeline links across the international border;

   ii) gathering line companies, for pipelines which transport the field production from several pipeline laterals;

   iii) single-line system companies, for pipelines which transport field production from a limited number of wells to a gathering pipeline system; and

   iv) natural gas transmission system companies, for regional pipeline systems.

A tabulated summary of the information responses is provided in Appendix IV. The following sections provide an explanation of the analysis of the information responses.

#### 3.2.1 Use of Remotely Operated Valves

In respect of the use and location of remotely operated valves, companies were requested to provide:

a) a description of their policy regarding the use of remotely operated sectionalizing and isolating valves on its pipeline system;

b) an explanation of the criteria utilized in assessing the critical areas of its pipeline system where sectionalizing and isolating valves should be remotely operated; and

c) a description of their response time standards for isolating sections of pipeline.

With respect to company policies on the use of remotely operated valves, companies generally followed the requirements of the applicable CSA standards. Seven pipeline companies stated that remotely operated valves had been installed on their systems, although not specifically required by the

standards. The remotely operated valves were installed primarily to allow them to sectionalize smaller segments of a pipeline. Regional crude oil transmission pipelines and natural gas transmission pipelines generally do not make extensive, if any, use of remotely operated valves on their pipeline systems.

After reviewing its system and discussions with Board staff, one company in the products group agreed to install remotely operated valves at a river crossing.

Overall, there were twelve companies that stated they either did not have a policy or did not clearly state their policy regarding the use of remotely operated valves Only one of these twelve pipeline companies is specifically required by the CSA to utilize remotely operated isolating and sectionalizing valves due to the type of product transported in its pipeline system.

With regard to the criteria that companies utilize in assessing the need for remotely operated valves, the most often stated criteria were population proximity, pipeline length, environmental damage, product composition, and compliance with the CSA standards.

With regard to response time standards, thirty-five companies stated they did not have any specific response time standards established. For those who did state their response time to sectionalize a pipeline segment with a reported leak, companies utilizing remotely operated valves indicated they are capable of closing a valve in 45 seconds to 20 minutes depending on the size of the line. In comparison, companies utilizing manual valves required 1 to 4 hours, depending on the distance to the valve and the difficulty in accessing a valve due to its geographical location.

### 3.2.2 Initial Response to Reported Leaks

Pipeline companies were requested to describe their emergency response plan to a reported leak on a line including:

a) the preferred order of the following actions in responding to a reported leak;

   i) shut down the pipeline;

   ii) verify the location of the leak; or

   iii) analyze instrumentation data to verify a leak; and

b) the criteria that would trigger the initiation of its emergency response plan.

Twenty-three companies stated that they would immediately shut down their pipeline on receiving a report of a leak. Twenty-two companies stated that they would first verify the leak and its location before shutting down the affected pipeline segment. The remainder stated they would first analyze their pipeline's telemetry or leak detection system before deciding to either determine the exact location of the leak or taking steps to shut down the pipeline.

With respect to the responses of companies by categories, the oil and products pipeline companies indicated that they would shut down their pipeline first before verifying the exact location of the leak. The principal reason was to limit the extent of environmental damage that may result from an oil leak. The HVP pipelines in the product group category indicated that they would shut down the pipeline as

the first action to a reported leak to address the extreme hazard associated with a leak. Natural gas pipeline companies indicated a clear preference for verifying the leak and its location before shutting down a pipeline. Four of the five major gas transmission companies stated the reason for this was to avoid isolating its customers downstream of the leak.

In respect of the criteria that would trigger the initiation of a company's emergency response procedure, there were two different types of responses. Thirty of the companies stated that an incoming report, or detection of a leak by its pipeline telemetry system, operating personnel or others was sufficient to trigger the implementation of the emergency response procedures. Twenty companies, however, responded to this request by identifying the types of hazards that would be required to trigger the implementation of it emergency response procedures. These included risk to the public or company employees; service disruption; property damage; fire or explosion; and environmental consequences.

Nine of the ten regional gas transmission pipeline companies stated that a reported leak would initiate its emergency response plan. However, five of these companies also stated that they would also take into consideration the customers that they would be shutting in when deciding on whether to isolate a reported leak. As was stated in one of the responses, shutting in customers may be a greater safety hazard than the leak itself, depending on factors such as the size of a pipeline leak and the time of the year.

### 3.2.3 Other Considerations

The Board notes that there are other factors that are critical to response time during pipeline emergencies. In particular, the leak detection capability of the pipeline control system, and the capability of pipeline control operators to correctly interpret information from the control system. Although these were not addressed in the information request, they have a significant impact on a company's response capabilities.

The subject of leak detection capability of pipeline control systems was examined in detail by the Board and the pipeline industry in 1988 following a review of the Board's recommendations arising from the inquiry into a pipeline incident near Camrose, Alberta. At that time, the pipeline industry undertook to develop requirements for leak detection for incorporation in Z183. A recommended practice for leak detection was subsequently adopted as Appendix H in that standard. It was recognized that leak detection capabilities for gas pipelines would differ significantly from those for oil pipelines given the state of the technology. The subject of control operator training was also examined in 1988 and requirements were incorporated as part of the recommended practice in Appendix H of Z183.

The Board's analysis of pipeline accidents in recent years indicates that there is a need to examine the degree to which oil pipeline companies meet the requirements of Appendix H, specifically in respect of leak detection capability and operator training. Such an examination will likely be expanded to include an assessment of leak detection capability and operator training for gas pipelines.

## 3.3 Conclusion

In summary, companies meet or exceed the requirements of the CSA standards in respect of the utilization of remotely operated isolation and sectionalizing valves, which allows them to quickly and safely isolate sections of their system during emergencies. In respect of initial response to reported

leaks, the Board considers that the practices followed by companies are generally acceptable and that the appropriate response should depend on the product transported, proximity of the pipeline to population and environmentally sensitive areas, and diameter and operating pressure of the pipeline, and the risks associated with unnecessarily shutting down a pipeline.

As part of its ongoing monitoring program, the Board will examine pipeline company practices with respect to leak detection and operator training.

**Appendix I**

**NEB Information Request Dated 14 May 1993**

National Energy Board — Office national de l'énergie

CANADA

File No.: 3750-T1-5

14 May 1993

**BY FACSIMILE**

To: PIPELINE COMPANIES UNDER THE BOARD'S JURISDICTION
AS PER ATTACHED LIST

**Re: Transportation Safety Board ("TSB") Report Number P90H0606**

Please find attached a copy of the above mentioned report, wherein the TSB has recommended that:

> "The National Energy Board ensure that, in an emergency, sections of line beyond crossover points on federally regulated pipelines can be quickly and safely isolated."
>
> (P92-06)

In order to respond to the TSB's recommendation, the Board will be assessing the general emergency response capabilities of pipeline systems under its jurisdiction. Therefore, to gain a more detailed understanding of your company's emergency response policies and capabilities, the Board requires additional information as set out in the attached requests.

If any of the requests are not applicable to your company's pipeline design, please provide an explanation. If you require clarification of any of the requests, please contact Brian Fowler at (403) 299-2782. Please respond to the information requests by 19 June 1993.

J. S. Richardson
Secretary

Attachments

cc. John W. Stants
Chairman
Transportation Safety Board

## Appendix I

## NEB Information Request Dated 14 May 1993



Transportation Safety Board Report Number P90H0606 - Information Request

1) Reference: Canadian Standards Association CAN/CSA-Z183-M90 section 5.2.10.2-Isolating Valves and section 5.2.10.3-Sectionalizing Valves, and CAN/CSA-Z184-M92 section 5.14.1-Valve Spacing and section 5.14.2-Valve Location.

Transportation Safety Board ("TSB") Report No. P90H0606 page 16 section 4.2.2 paragraph 2 states: "Had remote valves been operational at TCPL's MLV 300-1 and MLV 300-2, TCPL personnel should have been able to quickly and safely isolate the affected pipeline, thus reducing the risk to the public."

Preamble: The CAN/CSA Z183-M90 and Z184-M92 standards specify minimum spacing requirements for sectionalizing valves, location requirements for isolating valves and requirements for remotely operated valves (which is limited to high vapour pressure product service). As well, the TSB report identified the concern of being able to quickly and safely respond to a reported leak, and concluded that remotely operated valves at Main Line Valve ("MLV") 300-1 and MLV 300-2 would have assisted in the response time to the reported leak. The Board requires information regarding the application and location of remotely operated valves on your pipeline system.

Request: Please provide information on the use and location of remotely operated valves including:

a) a description of your company's policy and the rationale for the policy with regard to the use of remotely operated sectionalizing and isolating valves on your pipeline system;

b) an explanation of the criteria (e.g., population density, pipeline laterals, etc.) utilized in assessing the critical areas of your pipeline system where sectionalizing and isolating valves should be remotely operated;

c) a map of your pipeline system identifying the location of remotely operated sectionalizing and isolating valves;

d) the location of any valves that are not remotely operated but should be so as to conform with the company's policy and critical area assessment;

e) an explanation for any valves which are not remotely operated as referred to in d) above; and

f) a description of any response time standards for isolating sections of pipeline developed by your company.

**Appendix I**

**NEB Information Request Dated 14 May 1993**



2) Reference: Transportation Safety Board Report No. P90H0606, page 8, section 1.7, paragraph 1 states: "Lines 300-1 and 300-2 are two parallel pipelines that deliver natural gas to TCPL's OSMS (Ottawa Sales Meter Station). These two lines are fed from Lines 100-1 and 100-2 which deliver natural gas to Montreal and points beyond."

Transportation Safety Board ("TSB") Report No. P90H0606, page 12, subsection 4, states: "Because TCPL does not have total remote isolation capabilities on the Lines 300 to Ottawa from Lines 100 servicing the Montreal and Vermont markets, TCPL's emergency response personnel was required to travel by vehicle for a considerable distance to manually close MLV 302-1. This valve was closed at 1959 EDT, 2 hours and 45 minutes after the occurrence."

Preamble: As described by the TSB report, TransCanada decided not to utilize remotely operated valves located on main lines 100-1 and 100-2 to isolate the pipeline leak on lateral line 300-1 as it would have resulted in the isolation of several other major customers. However, the time required to manually close MLV 302-1 to isolate the leak which was in a complex part of its pipeline system extended TransCanada's total response time. The Board requires information on your company's policies and practices in responding to an emergency.

Request: Please provide a description of your company's emergency response plan to a reported pipeline leak including:

a) an explanation of your company's policy and practices with respect to isolating a reported leak, given circumstances similar to those in the TSB report, including whether you would:

i) always immediately shut down the pipeline system when a leak is reported;

ii) first verify, by field personnel, the leak and its location before deciding how to isolate the affected pipeline section; or

iii) analyze pipeline instrumentation data for confirmation of the leak, its location and its size before initiating steps to isolate the leak; and

b) a description of the criteria your company has established that would trigger the initiation of its emergency response plan.

**Appendix I**

**NEB Information Request Dated 14 May 1993**

## NEB REGULATED COMPANIES

| Company | Contact |
|---|---|
| Alberta Natural Gas Company Ltd. | J.H. Smit |
| Amerada Hess Canada Ltd. | H.L. Hooker |
| Amoco Canada Resources Limited | R.B. Rose |
| Aurora Pipe Line Company | R. Drevery |
| Blue Range Resource Corporation | G.R. Emett |
| Bow Valley Industries Ltd. | I. Herring |
| Canadian Hunter Exploration Ltd. | K. Wilford |
| Canadian-Montana Pipeline Company | R. Rawls |
| Centra Transmission Holdings Inc. | B. Jardine |
| Champion Pipe Line Corporation Limited | R. Bedard |
| Cochin Pipe Lines Ltd. | E. Baraniuk |
| The Consumers' Gas Company Ltd. | P. Widdifield |
| Dome Kerrobert Pipeline Ltd. | E. Baraniuk |
| Dome NGL Pipeline Ltd. | E. Baraniuk |
| ELAN Energy Inc. | P. Pelensky |
| Imperial Oil Ltd. | R.R. Moore |
| Ethane Shippers Joint Venture | A.R. Fraser |
| Foothills Pipe Lines Ltd. | H.N.E. Hobbs |
| Genesis Pipeline Canada Ltd. | J. Kinahon |
| Huntingdon International Pipeline Corporation | E.C. Eddy |
| Husky Border Pipelines Ltd. | J.M. Pasieka |
| Interprovincial Pipe Line (NW) Inc. | D.B. MacDermott |
| Interprovincial Pipe Line Inc. | D.B. MacDermott |
| Inverness Petroleum Limited | W.J. Nelson |
| Koch Exploration Canada, Ltd. | P. Jung |
| Manito Pipelines Ltd. | P. Hardy |
| Many Islands Pipe Lines (Canada) Limited | R.L. Haynes |
| Mid-Continent Pipelines Limited | M.E. Beckerleg |
| Minell Pipeline Ltd. | D. Case |
| Montreal Pipe Line Limited | G. Robitaille |
| Murphy Oil Company Ltd. | P. Hardy |
| Niagara Gas Transmission Limited | R.J. Riedl |
| Northwest Transmission Company Limited | D. Miller |
| Peace River Transmission Company Limited | G. Johnson |
| Petroleum Transmission Company | M. Bell |
| Petrorep Canada Ltd. | D. Brown |
| Poco Petroleums Ltd. | K.S. King |
| Pouce Coupe Pipe Line Ltd. | J.A. Ion |
| SCL Québec Pipeline Inc. | B. W. Mitchell |
| Shell Canada Products Limited | H. Lemieux |
| St. Clair Pipelines Ltd. | T. Karry |

**Appendix I**

**NEB Information Request Dated 14 May 1993**

## NEB REGULATED COMPANIES

| Company | Contact |
|---|---|
| Sun Pipe Line Company | R. Cowell |
| Talisman Energy Inc. | A.V. Cameau |
| Trans Mountain Pipe Line Company Ltd. | G. A. Irving |
| Trans Québec & Maritimes Pipeline Inc. | R. Heider |
| Trans-Northern Pipelines Inc. | J.F. Lang |
| TransCanada PipeLines Limited | G. Bennett |
| Union Gas Limited | I. Leadley |
| Wascana Pipe Line Ltd. | W.G. Colvin |
| Westcoast Energy Inc. | A. Edgeworth |
| Westspur Pipe Line Company (1985) Inc. | E.A. Yasinko |
| Yukon Pipelines Limited | A. Ali |
| 167496 Canada Ltd. | R. Kwan |

# Appendix II

## Z183 and Z184 - Requirements for Isolating and Sectionalizing Valves

Z183

**5.2.10 Valves**

**5.2.10.2 Isolating Valves**
Except for multiphase and oilfield water pipelines, isolating valves shall be installed on all lateral lines connected to main lines. Such valves shall be located as close as practicable to the main lines in a manner that will effectively isolate facilities such as pumping stations, tank farms, refineries, terminals, drain lines, and vents from the main line.

**Note:** Because of the nature and location of most multiphase and oilfield water pipelines, isolating valves on lateral lines are not mandatory but consideration should be given to their use.

**5.2.10.3 Sectionalizing Valves**

**5.2.10.3.1 General**
In order to limit damage from accidental discharge, sectionalizing valves shall be installed on both sides of major water crossings and at other locations appropriate for the terrain.

**Note:** Consideration should be given to the installation of check valves where practicable to provide automatic blockage of the piping system.

**5.2.10.3.2 HVP Pipelines**

**5.2.10.3.2.1**
Sectionalizing valves shall be installed outside cities, towns, and villages at the transition from Zone Location 1 to Zone Location 2. In Zone Location 2, the maximum spacing between valves shall not exceed 15 km.

**5.2.10.3.2.2 Remotely Operated Valves**
Where an HVP pipeline failure would constitute an extraordinary hazard, sectionalizing valves shall be equipped for remote operation and the maximum spacing between such valves shall not exceed 15 km.

Note: Extraordinary hazards may occur in such areas as major industrial complexes, commercial navigable waters, and densely populated urban areas.

## Appendix II

## Z183 and Z184 - Requirements for Isolating and Sectionalizing Valves

**Z184**

**5.14.1 Valve Spacing**

**5.14.1.1**
Sectionalizing block valves shall be installed at spacings commensurate with class locations, accessibility, and the potential hazards of the type of gas being conveyed. The spacing shall not exceed 25 km within Class 2 Locations, 13 km within Class 3 Locations, and 8 km within Class 4 Locations.

**Appendix III**

**NEB Information Request Dated 14 May 1993 - Company Categories**

| Company | Category |
|---|---|
| Interprovincial Pipe Line Inc. | Category 1 Oil |
| Trans Mountain Pipe Line Company Ltd. | Category 1 Oil |
| Aurora Pipe Line Company | Category 2 Oil |
| Imperial Oil Resources Limited | Category 2 Oil |
| Interprovincial Pipe Line (NW) Ltd. | Category 2 Oil |
| Inverness Petroleum Limited | Category 2 Oil |
| Manito Pipelines Ltd. | Category 2 Oil |
| Montreal Pipe Line Limited | Category 2 Oil |
| Murphy Oil Company Limited | Category 2 Oil |
| Northwest Transmission Company Limited | Category 2 Oil |
| Pouce Coupe Pipe Line Ltd. | Category 2 Oil |
| Wascana Pipe Line Ltd. | Category 2 Oil |
| Westspur Pipe Line Company (1985) Inc. | Category 2 Oil |
| Yukon Pipelines Limited | Category 2 Oil |
| Cochin Pipe Lines Ltd. | Products Category |
| Dome Kerrobert Pipeline Ltd. | Products Category |
| Dome NGL Pipeline Ltd. | Products Category |
| Ethane Shippers Joint Venture | Products Category |
| Genesis Pipeline Canada Ltd. | Products Category |
| Husky Border Pipelines Ltd. | Products Category |
| Petroleum Transmission Company | Products Category |
| SCL Pipeline Inc. | Products Category |
| Sun Pipe Line Company | Products Category |
| Trans-Northern Pipelines Inc. | Products Category |
| Alberta Natural Gas Company Ltd. | Category 1 Gas |
| Foothils Pipe Lines Ltd. | Category 1 Gas |
| Trans-Quebec & Maritimes Pipelines Inc. | Category 1 Gas |
| TransCanada Pipelines Limited | Category 1 Gas |
| Westcoast Energy Inc. | Category 1 Gas |

**Appendix III**

**NEB Information Request Dated 14 May 1993 - Company Categories**

| Company | Category |
|---|---|
| Category 2 Gas Companies | |
| Huntingdon International Pipeline Corporation | Connection Line |
| St. Clair Pipelines Ltd. | Connection Line |
| Union Gas Limited | Connection Line |
| Blue Range Resource Corporation | Gathering Lines |
| Canadian Hunter Exploration Ltd. | Gathering Lines |
| Peace River Transmission Company Liimited | Gathering Lines |
| Petrorep (Canada) Ltd. | Gathering Lines |
| Poco Petroleums Ltd. | Gathering Lines |
| 167496 Canada Ltd. (Norcen) | Single Line System |
| Amoco Canada Resources Limited | Single Line System |
| Bow Valley Industries Ltd. | Single Line System |
| ELAN Energy Inc. | Single Line System |
| Koch Exploration Canada, Ltd. | Single Line System |
| Talisman Energy Inc. | Single Line System |
| Amerada Hess Canada Ltd. | Gas Transmission System |
| Canadian-Montana Pipe Line Company | Gas Transmission System |
| Centra Transmission Holdings Inc. | Gas Transmission System |
| Champion Pipe Line Corporation Limited | Gas Transmission System |
| Consumers' Gas (Canada) Ltd. | Gas Transmission System |
| Many Islands Pipe Lines (Canada) Limited | Gas Transmission System |
| Mid-Continent Pipelines Limited | Gas Transmission System |
| Minell Pipeline Ltd. | Gas Transmission System |
| Niagara Gas Transmission Limited | Gas Transmission System |
| SCL Quebec Pipeline Inc. | Gas Transmission System |

## Appendix IV

## Summary of Responses

**Question 1:** Please provide information on the use and location of remotely operated valves including:

| Group (Total of 53 companies) | a: policy and rationale regarding the use of remotely operated valves; | b: criteria utilized in assessing where valves should be remotely operated; | c: a map of your pipeline system; |
|---|---|---|---|
| Category 1 Oil (2 companies) (see Note 1) | 2 CSA standards | 1 population proximity, 2 environmental, 1 CSA standards, 1 industry practices, 1 product type | all provided maps or drawings |
| Category 2 Oil (12 companies) | 1 high risk areas, 9 CSA standards, 1 at mainline terminals only, 1 company not clearly stated | 2 environmental, 1 water crossings, 9 population proximity, 5 CSA standards, 1 company none | all provided maps |
| Products Category (10 companies) | 8 CSA standards, 2 companies not clearly stated | 3 population proximity, 1 pipe profile, 1 environment, 2 CSA standards, 1 power and communications, 5 company none, 1 company not stated | 8 provided maps, 1 description only, 1 company nothing |
| Category 1 Gas (5 companies) | 3 CSA standards, 2 rely on automated valves | 2 population proximity, 1 environmental impact, 1 at compressor stations, 1 at system junctions, 1 company none, 1 company not stated | 4 provided maps, 1 company nothing |
| Category 2 Gas | | | |
| Connection Line (3 companies) | 1 at border crossings, 2 companies none | 1 facility isolation, 2 companies none | all maps provided |
| Gathering System (5 companies) | 3 CSA standards, 1 relies on automatic valves only, 1 to meet provincial (Alberta) gas gathering standards | 3 population proximity, 1 pressure, 2 product composition, 1 pipeline size or length, 1 company none | 3 provided maps, 1 description only, 1 company nothing |
| Single Line System (6 companies) | 3 CSA standards, 1 public or environmental risk, 2 company not clearly stated | 1 CSA standards, 3 population proximity, 1 pressure, 2 pipe length, 3 company none, 1 company not stated | 5 provided maps, 1 company nothing |
| Transmission System (10 companies) | 3 CSA standards, 1 lines>273.1mm dia., 1 for dispatch purposes only, 5 companies none | 3 population proximity, 1 product type, 1 pipe length, 1 at meter & compressor stations, 6 companies none, 1 company not stated | 5 provided maps, 1 description only, 4 companies nothing |

## Appendix IV

## Summary of Responses

**Question 1 (continued** Please provide information on the use and location of remotely operated valves including:

| Category (Total of 53 companies) | d: valve locations that should be remotely operated to conform to company's policy and criteria; | e: explanation for any valves that are referred to in d); and | f: description of response time standards for isolating sections of pipeline. |
|---|---|---|---|
| Category 1 Oil (2 companies) (see Note 1) | 2 N/A | 2 meet CSA standards but system will be reviewed for add'l remotely operated valves | 1 (3min), 1 (14min to 1.5 hrs max) |
| Category 2 Oil Companies (12 companies) | 12 N/A | 11 N/A, 1 meets CSA standards but system will be reviewed for add'l remotely operated valves | 3 immediate, 1 (3min), 2 (<30min), 4 (1-2hrs), 2 company none |
| Products Category (10 companies) | 9 N/A, 1 indicated on map | 9 N/A, 1 (TNPI) to add 9 remotely and 5 manually operated valves by 1998 | 2 (immediate), 2 (<5min), 1 (<15min), 1 (<1.5hrs), 4 companies none |
| Category 1 Gas (5 companies) | 4 N/A, 1 under review | 4 N/A, 1 under review | 1 (<30 min), 1 (< 2hr), 1 (<4hrs), |
| Category 2 Gas | | | |
| Connection Line (3 companies) | 3 N/A | 3 N/A | 3 companies none |
| Gathering System (5 companies) | 5 N/A | 5 N/A | 1 (2hr), 4 companies none |
| Single Line System (6 companies) | 6 N/A | 6 N/A | 1 (<30min), 1 (<1hr), 1 (1-2hr) 3 companies none |
| Transmission System (10 companies) | 10 N/A | 10 N/A | 1 (<60 min), 1 (<2.5hr), 8 companies none |

## Appendix IV

## Summary of Responses

**Question 2:** Please provide a description of your company's emergency response plan to a reported pipeline leak including:

| Group (Total of 53 companies) | a: preference in responding to reported<br>i: shut down pipeline;<br>ii: verify leak location in field;<br>iii: analyze instrumentation data; and | b: criteria for initiating emergency response procedures. |
|---|---|---|
| Category 1 Oil (2 companies) (see Note 1) | 2(i, ii, iii) | 2 reported, 1 detected |
| Category 2 Oil (12 companies) | 3(i,ii,iii), 2(i), 5(i,ii), 1(iii,i,ii), 1(ii,i) | 10 reported, 8 detected, 2 operating personnel, 1 patrols, 1 environmental risk |
| Products Category (10 companies) | 6(i,ii,iii), 1(iii,i), 2(i,ii), 1(iii,ii,i) | 5 reported, 1 detected, 5 public risk, 3 fire/explosion |
| Category 1 Gas (5 companies) | 1(i,ii), 3(ii,iii,i), 1(iii,ii,i) | 1 reported, and 1 detected, 2 environmental risk, 4 public risk, 3 service disruption, 3 property risk |
| Category 2 Gas Connection Line (3 companies) | 1(ii,i), 1(ii,iii,i), 1(ii,iii,i) | 1 reported, 2 public risk, 2 service disruption, 2 property risk |
| Gathering System (5 companies) | 1(i), 2 (ii,i), 1(iii,i), 1(i,ii) | 5 reported, 3 detected, 1 environmental risk, 3 public risk, 1 fire/explosion |
| Single Line System (6 companies) | 2(i), 3(ii,i), 1 (i,ii,iii) | 2 reported, 3 detected, 2 environmental risk, 1 public risk, 1 property risk |
| Transmission System (10 companies) | 2(ii,iii,i), 7(ii,i), 1 company not clearly stated | 7 reported, 9 detected, 2 public risk, 1 fire/explosion, 3 service disruption, 1 leak severity, 2 injury/death, 3 companies not stated |